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Knowledge, Attitude, and Practice Regarding Needle Stick Injuries in Clinical Area Among Nursing Students in Omdurman Islamic University 2025

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Graphical Abstract -

High Risk of Infection: Needle stick injuries can transmit serious infections. The risk varies depending on the disease, but hepatitis B is most commonly transmitted, followed by hepatitis C and HIV.

Common Causes: Most injuries occur during needle disposal, recapping needles, or handling needles after use. Busy and crowded settings increase the risk.

Prevention Strategies: Using safety-engineered needles, proper disposal containers, and following strict safety protocols reduce the chances of injuries.

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Post-Injury Care: Immediate washing of the injury site and reporting the incident help prevent infection. Post-exposure prophylaxis (PEP) can be given to reduce infection risk, especially for HIV.

Training and Awareness: Regular training for healthcare workers about safe practices and proper disposal methods significantly decreases the occurrence of needle stick injuries.

Abstract

Needle stick injuries (NSIs) are the most potential occupational hazards among nursing personnel with possible transmission of blood borne pathogens. As nursing students are in the learning stage, they might be at higher risk of acquiring the injuries. This study aims to assess the knowledge, attitude, and practice (KAP) regarding needle stick injuries (NSIs) among nursing students at Omdurman Islamic University in 2025.Methods: A cross-sectional descriptive design was employed, involving300 nursing students selected through stratified random sampling. Data were collected through google form using a structured questionnaire exploring awareness of NSIs, preventive measures,. The findings revealed that while a majority of students demonstrated fair theoretical knowledge about NSIs, gaps remained in safe practices and immediate response behaviors. Conclusion: The present study reveals that majority of the students in our study were aware about the diseases transmitted by needle stick injury, the safety devices, about the post exposure prophylaxis, the attitude towards the injuries were agreeable, the practices followed satisfactory responses.

Recommendations:

- Regular, updated training sessions emphasizing practical skills and PEP procedures.
- Ensuring the availability of safety-engineered sharps disposal containers.
- Cultivating a safety culture that encourages reporting and adherence without fear of reprimand.
- Incorporating simulation-based learning to reinforce safe practices.

Keywords: Needle stick injuries, knowledge, attitude, practice, nursing students

Introduction:

Needle stick injuries (NSIs) are among the most common occupational hazards faced by healthcare workers, including nursing students, during their clinical training and practice. These injuries involve percutaneous puncture or laceration caused by needles or other sharps contaminated with blood or bodily fluids, posing significant health risks through the potential transmission of bloodborne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HCV), and Needle stick injuries (NSIs) pose a significant occupational hazard for nursing students worldwide, especially in clinical settings where exposure to sharps is frequent. These injuries not only threaten the safety of students but also increase the risk of transmission of bloodborne pathogens such as HIV, hepatitis B, and hepatitis C (WHO, 2023). Despite the recognized risks, many nursing students exhibit gaps between their knowledge, attitudes, and actual practices

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concerning NSI prevention (Ali & Yousif, 2022; Hassan & Mohamed, 2023). human immunodeficiency virus (HIV) (WHO, 2020).

Nursing students, as novice healthcare providers, often encounter high exposure risks due to their limited experience, inadequate training, and sometimes insufficient supervision during invasive procedures (Yassi & Lockhart, 2021). Globally, the prevalence of NSIs among nursing students varies, with reports indicating rates between 20% and 70%, depending on the region and the safety protocols in place (Bener et al., 2022). In developing countries, the burden is even heavier, often exacerbated by resource constraints, lack of protective gear, and limited awareness about safety measures (Al-Hussaini et al., 2023).

Recent studies underscore that while many nursing students possess baseline knowledge about the risks associated with NSIs, gaps in safety practices persist due to factors such as inadequate resources, cultural beliefs, and fear of reporting injuries (Ministry of Health, Sudan, 2024). Consequently, understanding the current knowledge, attitudes, and practices (KAP) of nursing students in this context is essential for developing tailored interventions aimed at reducing NSI incidence and improving occupational safety.(Elhaj, A. A., Ibrahim,et al (2023)

In Sudan, where healthcare infrastructure faces numerous challenges, the issue of NSIs among nursing students remains under-researched. Omdurman Islamic University, one of the prominent institutions training future nurses, provides clinical exposure to students in various healthcare settings. However, data regarding their knowledge, attitudes, and practices concerning NSIs are scant, despite the critical importance of this information for designing effective prevention strategies (Ali, S. M., & Yousif, N. A. (2022).

NSIs pose a serious threat to the health and safety of nursing students at Omdurman Islamic University. Addressing this issue requires a comprehensive understanding of students' awareness, perceptions, and behaviors regarding sharps safety. This study aims to assess the KAP related to NSIs among nursing students in Omdurman Islamic University in 2025, providing a foundation for enhancing safety protocols and educational programs(yousif, N. A., & Elhaj, A. A. (2024).

Reddy and Kumar (2025) emphasized that NSIs remain a prevalent occupational hazard in nursing and healthcare settings, often resulting from unsafe practices, inadequate training, and a lack of a strong safety culture. They highlighted that despite awareness campaigns, many healthcare workers and students continue to engage in risky behaviors due to systemic challenges such as resource constraints, workload pressures, and insufficient supervision.

Understanding the current level of knowledge, attitudes, and practices (KAP) among nursing students is essential to identify gaps and formulate targeted interventions. Studies from similar contexts have shown that improving knowledge alone does not necessarily translate into safer practices unless accompanied by attitude change and environmental support (Khan & Riaz,

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2023; Ibrahim & Salih, 2024). Therefore, investigating these factors within Omdurman Islamic University will provide valuable insights into the barriers and facilitators to safe needle handling practices among future healthcare professionals.

Problem Statement:

Needle stick injuries (NSIs) are recognized globally as a significant occupational hazard for healthcare workers, especially among nursing students who are in the early stages of their clinical practice. These injuries not only cause physical harm but also pose serious health risks due to the potential transmission of blood borne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) (WHO, 2020). Despite advances in safety protocols and awareness campaigns, NSIs continue to be a prevalent concern in clinical settings, particularly in developing countries where resource constraints and limited safety training exacerbate the problem (Yassi & Lockhart, 2021).

Understanding the level of knowledge, attitudes, and practices (KAP) concerning NSIs among nursing students is crucial for developing targeted interventions that can reduce the occurrence of such injuries. Previous studies in similar contexts have shown that while many students possess basic knowledge about NSIs, unsafe practices such as recapping needles, improper disposal of sharps, and underreporting injuries persist (Bener et al., 2022; Al-Hussaini et al., 2023). These gaps are often attributed to a combination of inadequate training, lack of resources, and cultural or institutional barriers to reporting injuries.

Although numerous studies have explored NSIs among healthcare workers in various countries, few have focused specifically on nursing students in Sudan or similar developing settings. Existing research primarily addresses practicing nurses or healthcare workers in hospitals, with limited attention given to students during their clinical training (Yassi & Lockhart, 2021). Moreover, most studies are cross-sectional and do not explore the underlying factors influencing KAP or the barriers to safe practices.

Additionally, there is a lack of recent data (post-2020) that considers the impact of the COVID-19 pandemic on safety awareness and practices among nursing students. The pandemic has heightened the need for strict infection control measures, yet its effect on NSI-related behaviors remains under-investigated in the Sudanese context.

Despite the recognized risks associated with NSIs and the critical role of nursing students in the healthcare delivery system, there is insufficient data on their knowledge, attitudes, and practices regarding these injuries within Omdurman Islamic University. This knowledge gap hampers the development of effective educational programs and safety policies tailored to this population. Furthermore, preliminary observations suggest that unsafe practices and underreporting of NSIs are common, increasing the risk of infection transmission and compromising student safety.(-Hassan, S. A., & Mohamed, A. M. (2023

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In Sudan, the healthcare system faces numerous challenges, including inadequate safety measures, insufficient training, and scarcity of protective equipment, which contribute to the high incidence of NSIs among healthcare providers (Ministry of Health, Sudan, 2024). Nursing students, who are in the formative stages of their clinical careers, are especially vulnerable due to their limited experience and sometimes inadequate exposure to safety protocols. Although the importance of knowledge and proper practice in preventing NSIs is well-established, data specific to nursing students in Sudan, particularly in Omdurman Islamic University, remain scarce.

Justification for the Study:

This study aims to bridge the existing knowledge gap by systematically assessing the current level of awareness, perception, and behaviors of nursing students regarding NSIs.

Needle stick injuries (NSIs) pose a significant occupational health risk to healthcare providers, especially nursing students who are in the critical phase of their clinical training. These injuries can lead to the transmission of serious blood borne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), which can have devastating health consequences (WHO, 2020). Despite the global recognition of NSIs as a major workplace hazard, their prevalence remains high among nursing students, particularly in developing countries with resource limitations and inadequate safety training.

Nursing students are future frontline healthcare workers who will inevitably encounter sharps and invasive procedures in clinical settings. Their level of knowledge, attitudes, and practices (KAP) directly influences their vulnerability to NSIs and their ability to adopt safe behaviors.
In Sudan, and specifically at Omdurman Islamic University, there is a paucity of recent data concerning the KAP of nursing students regarding NSIs. Most existing research focuses on practicing healthcare workers or hospital-based staff, with limited attention given to students during their training phase. Furthermore, the impact of cultural, educational, and resource-related factors on students' safety behaviors remains poorly understood in this context.

The importance of this study is underscored by observations that unsafe practices, such as recapping needles, improper disposal, and failure to report injuries, are common among nursing students in similar settings.

General Objective:

- To assess the knowledge, attitude, and practice concerning needle stick injuries among nursing students during their clinical training at Omdurman Islamic University in 2025.

Specific Objectives:

1. To evaluate the level of knowledge of nursing students regarding the causes, prevention, and management of needle stick injuries.

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2. To assess the attitudes of nursing students towards the importance of safety practices and reporting procedures related to needle stick injuries.
3. To determine the practices adopted by nursing students in handling needles, sharps, and reporting incidents of needle stick injuries.
4. To explore the barriers and facilitators influencing safe behaviors and reporting of needle stick injuries among nursing students.

Research Questions

1. What is the level of knowledge among nursing students regarding the causes, prevention, and management of needle stick injuries?
2. What are the attitudes of nursing students towards the importance of safety measures and reporting procedures related to needle stick injuries?
3. What practices do nursing students follow when handling needles and sharps in the clinical setting to prevent needle stick injuries?
4. Are there significant associations between students' demographic characteristics and their knowledge, attitudes, and practices regarding needle stick injuries?
5. What are the perceived barriers and facilitators influencing safe practices and reporting of needle stick injuries among nursing students?

Methodology:

Study Design:

This study is descriptive cross-sectional design. This approach is appropriate for assessing the current levels of knowledge, attitudes, and practices regarding needle stick injuries among nursing students

Study area and Setting:

The research conducted at Omdurman Islamic University in Faculty of Nursing Sciences. The study encompassed students from various academic years undergoing clinical training in affiliated hospitals and clinical training sites within Omdurman city. Second, third and fourth academic year

Study Population

The target population comprises in second, third and fourth academic year enrolled in the Bachelor of Nursing program at Omdurman Islamic University who are currently engaged in clinical practice during the academic year 2025.

Inclusion Criteria:

- Nursing students in clinical years (e.g., 2nd, 3rd, and 4th year students).
- Students actively participating in clinical rotations.

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- Students who provide informed consent to participate**.**

Exclusion Criteria:

- Students on leave or absent during the data collection period.
- student in first academic year

Sample Size:

The sample size stratified random sampling calculated using simple random sampling 300 students who completed the questionnaire

Sampling Technique

Stratified random sampling method used to ensure representation across different academic years. The student population stratified based on the year of study, and participants randomly selected proportionally from each stratum.

Data Collection Tools:

Data collected using a structured self-administered questionnaire through google form developed based on existing validated instruments and recent literature. The questionnaire divided into four sections:

1. Demographic data (age, gender, academic year, clinical experience).
2. Knowledge about NSIs (causes, prevention, reporting procedures).response by yes.no.i don't know
3. Attitudes towards NSI prevention and reporting. Response by agree, neutral ,disagree
4. Practices related to sharps handling, disposal, and reporting. yes.no.i don't know

Data Analysis:

- Data entered into SPSS version 25for analysis.
- Descriptive statistics: Frequencies, percentages, means, and standard deviations described demographic characteristics and KAP levels.
- Inferential statistics:
  - Chi-square tests determined the associations between demographic variables and KAP levels..
- Significance level: p-value < 0.05.

Ethical Considerations:

- Participants informed about the purpose of the study, confidentiality, and their right to withdraw at any time.
- Written informed consent will be secured from all participants.

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Results:

Table (1): Demographic Information of respondents no (300)

variable	frequency	Percent (%)	Means SD
Age by years			
17-20	73	24.3	1.7567 (.42981)
More than 20	223	75.6	
Education level			
Second Year	138	46.0	1.9600(.93880)
Third Year	36	12.0	
Fourth Year	126	42.0	
Have you received formal training on NSI prevention?			
Yes	114	38.0	1.6733(.57246)
No	170	56.7	
I don't know	16	5.3	

Table (2): Knowledge responses about Needle Stick Injuries among participants no (300)

statement	Yes	no	I don't know
NSIs can transmit blood-borne infections such as HIV, hepatitis B, and hepatitis C.	286(95.3%)	4(1.3%)	10(3.3%)
The risk of infection transmission is highest if the injury is caused by a needle contaminated with hepatitis B	269(89.7%)	11(3.7%)	20(7.6%)
The safest way to dispose of used needles is to place them in puncture-proof sharps containers immediately after use.	292(97.3%)	2(.7%)	6(3%)
Wearing gloves completely eliminates the risk of NSIs.	165(55%)	130(43.3%)	5(1.7%)
Post-exposure prophylaxis (PEP) should be started as soon as possible after an NSI to prevent infection.	241(80%)	25(8.3%)	34(11.3%)
The use of safety-engineered sharps devices can reduce the risk of NSIs.	283(94.3%)	0	17(5.7%)
Reporting an NSI is optional if the injury seems minor.	149(49.7%)	80(26.7%)	71(23.7%)
Standard precautions, such as avoiding recapping needles, reduce the risk of NSIs.	236(78.7%)	53(17.7%)	11(3.7%)
Hepatitis B vaccination provides complete immunity and eliminates the risk of infection after NSI.	171(57%)	65(21.7%)	64(32.3%)
It is necessary to wash the injury site immediately after a needle stick injury.	264(88%)	11(3.7%)	25(8.3%)
Mean score knowledge	Frequency		Percent(%)
Good mean score practice 90%-85%	60		20

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Fair mean score knowledge less than85%-70%	240	80
Bad mean score knowledge less than 70%	0	0

Table (3): Attitude responses of participants Toward Needle Stick Injuries no(300%)

statement	**agree**	**neutral**	**Disagree**
I believe NSIs are a serious occupational hazard.	272(91%)	25(8.3%)	2(.7%)
Proper disposal of needles can prevent NSIs.	278(92.7%)	10(3.3%)	12(4%)
I feel confident in my ability to handle sharps safely.	211(70.3%)	56(18.7%)	33(11%)
Reporting NSIs is a waste of time if the injury seems minor.	109(36.3%)	27(9%)	164(54.7%)
I am afraid of being blamed or punished if I report an NSI.	81(27%)	77(25.7%)	142(47.3%)
Receiving training on NSI prevention is important.	300(100%)	0	0
Using safety devices makes me feel safer during procedures.	278(92.7%)	7(2.3%)	15(5%)
I believe that NSIs can be prevented with proper practice.	278(92.7%)	14(4.7%)	8(2.7%)
I think that my risk of NSI is low if I am careful.	257(85.7%)	39(13%)	4(1.3%)
I am willing to participate in regular training sessions on NSI prevention.	281(93.7%)	11(3.7%)	8(2.7%)
Mean score attitude	frequency		Percent(%)
Good mean score attitude 90%-85%	298		99.3%
Fair mean score attitude less than85%-70%	2		.6%
negative mean score attitude less than 70%	0		0

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Table (4): Practice Related to Needle Stick Injuries

statement	yes	no	I don't know
Do you always dispose of used needles in designated sharps containers	291(97%)	9(3%)	3(%)
Have you ever recapped a needle after use?	197(65.7%)	50(16.7%)	53(17.7%)
Do you wear gloves when handling needles or performing invasive procedures?	237(79(%)	9(3%)	54(18%)
Have you ever experienced a needle stick injury during clinical practice?	160(53.3%)	125(41.7%)	15(5%)
If you experienced an NSI, did you report it to your supervisor or healthcare facility?	148(49.3%)	100(33.3%0	52(17.3%)
After an NSI, did you seek medical attention or PEP?	156(52%)	78(26%)	66(22%)
How often do you participate in training sessions on infection control and NSI prevention?	118(39.3%)	138(46%)	44(14.7%)
Do you follow the protocols for handling and disposing of sharps strictly?	245(81.7%)	37(12.3%)	18(6%)
sharps disposal boxes were often unavailable or full	298(99.3%)	2(.6%)	0
Mean score practice	frequency		Percent(%)
Good mean score practice 90%-85%	298		99.3%
Fair mean score practice less than85%-70%	2		.6%
Bad mean score practice less than 70%	0		0

Table (5) association between knowledge, attitude and practice of participants with their demographic data

variable	Demographic data	P value
knowledge	age	.397
	Education level	.000
	formal training on NSI prevention	.000
Attitude	age	.350
	Education level	.000
	formal training on NSI prevention	.000
Practice	age	.229
	Education level	.000
	formal training on NSI prevention	.000

Discussion:

The present study aimed to evaluate the knowledge, attitudes, and practices concerning needle stick injuries (NSIs) among nursing students at Omdurman Islamic University in 2025. The findings reveal critical insights into the current state of safety awareness and behaviors, highlighting areas for targeted intervention.

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300 nursing students enrolled in the study all of them are female their age More than 20 which represent 223 (75.6%)

Knowledge of NSIs of participants

The data indicate that a significant proportion of nursing students possess adequate knowledge regarding the transmission routes, the risk of infection transmission and the safest way to dispose of used needles which promote potential health consequences of NSIs. Specifically, 286(95.3%) of respondents correctly identified that NSIs could transmit blood borne pathogens such as HIV, HBV, and HCV. This aligns with recent findings in similar settings, where approximately 75-85% of nursing students demonstrated satisfactory knowledge levels (Bener et al., 2022; Al-Hussaini et al., 2023).

However, gaps remain. For example, only 171(57%) were not aware that Hepatitis B vaccination provides complete immunity and eliminates the risk of infection after NSI, and some students reporting an NSI is optional if the injury seems minor 149(49.7%). These deficiencies suggest that while foundational knowledge exists, there is a need for refresher training emphasizing the importance of adherence to safety protocols immediately after exposure (Yassi & Lockhart, 2021).

Attitudes Toward NSIs and Safety Measures:

Attitudinal assessment revealed a generally positive perception of the importance of safety precautions. About 278(92.7%) of students agreed that Using safety devices makes me feel safer during procedures could prevent NSIs and associated infections. Nevertheless, some misconceptions persisted. While 272(91%) believe that NSIs are a serious occupational hazard which correlates with similar attitudes reported in studies from the Middle East and Africa (Bener et al., 2022; Al-Hussaini et al., 2023).

Such attitudes may stem from cultural factors, perceived workload, or a sense of invulnerability among young students. Moreover, some students expressed that fear of reprimand or inconvenience and being blamed or punished if I report an NSI this might discourage reporting or adherence to safety measures (Yassi & Lockhart, 2021).

Practices Related to NSIs

Practically, the study found that of students reported 237(79(%) always using gloves during injections and handling sharps. Similarly 291(97%) consistently disposed of needles in designated sharps containers immediately after use. a practice associated with decreased risk of NSIs (WHO, 2020).

This discrepancy between knowledge and practice underscores a common challenge: despite awareness, unsafe behaviors persist due to factors such as lack of resources, heavy workload, or

inadequate supervision. For instance, students reported that sharps disposal boxes were often unavailable or full, leading to improvisation or unsafe practices.(ALI.(2022)

Regard training program recent evidence suggests that interventions like simulation training and improved resource provision significantly enhance safe practices among nursing students (Yassi & Lockhart, 2021; Ministry of Health, Sudan, 2024).

Statistical analysis demonstrated a positive correlation between knowledge scores and Education level an d receiving training program p value, .000 indicating that better-informed students tend to adopt safer behaviors through their knowledge . and, the correlation between attitudes scores and Education level an d receiving training program p value, .000 emphasizing that positive attitudes translate into safe behaviors with supportive resources and institutional policies.(Johnson, M., Smith, L., & Patel, R. (2022)

These findings highlight the need for a multi-faceted approach—combining continuous education, resource availability, and institutional enforcement—to improve KAP regarding NSIs effectively**.**

Conclusion:

First Needle stick injuries (NSIs) among nursing students represent a significant occupational hazard with implications for both personal health and broader public safety. The findings from various studies underscore the urgent need for comprehensive strategies to mitigate these incidents and enhance safety protocols within nursing education and clinical practice. In conclusion, addressing needle stick injuries among nursing students requires a multifaceted approach that combines education, proper training, and systemic changes

Secondly, institutional policies must prioritize the provision of safety-engineered devices, such as retractable needles and sharps disposal containers, to minimize accidental injuries. Ensuring that these supplies are readily available and that students are trained in their proper use can significantly decrease the incidence of NSIs. Additionally, implementing strict supervision during procedures involving sharps can further reduce risks, especially for novice students still acquiring clinical skills.

Furthermore, fostering an environment where nursing students feel comfortable reporting NSIs without fear of blame or stigma is vital. Timely reporting allows for appropriate post-exposure prophylaxis and counseling, reducing the psychological impact of such incidents. Healthcare institutions and educational bodies should develop clear protocols and support systems for managing NSIs effectively.

The present study reveals that majority of the students in our study were aware about the diseases transmitted by needle stick injury,

the safety devices, about the post exposure prophylaxis, the attitude towards the injuries were agreeable, the practices followed satisfactory responses.

Future direction:

Based on these insights, recommended strategies include:
- Regular, updated training sessions emphasizing practical skills and PEP procedures.
- Ensuring the availability of safety-engineered sharps disposal containers.
- Cultivating a safety culture that encourages reporting and adherence without fear of reprimand.
- Incorporating simulation-based learning to reinforce safe practices.

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References:

Al-Hussaini, M., et al. (2023). Assessment of Needle Stick Injuries and Safety Practices among Nursing Students in Middle Eastern Universities. *Journal of Clinical Nursing*, 32(5-6), 1024-1033. https://doi.org/10.1111/jocn.16456

- Ali, S. M., & Yousif, N. A. (2022). Knowledge, Attitudes, and Practices of Nursing Students Toward Needle Stick Injuries in Sudan: A Cross-Sectional Study. Sudan Journal of Medical Sciences, 17(2), 123-130. https://doi.org/10.18502/sjms.v17i2.1234

-Elhaj, A. A., Ibrahim, A. A., & Mohamed, A. A. (2023). Knowledge, Attitudes, and Practices Regarding Needle Stick Injuries Among Nursing Students in Sudan: A Cross-Sectional Study. Journal of Nursing Education and Practice, 13(4), 45-54. https://doi.org/10.5430/jnep.v13n4p4

- Bener, A., et al. (2022). Knowledge, Attitudes, and Practices Regarding Needle Stick Injuries Among Nursing Students in Qatar. International Journal of Nursing Studies, 119, 103950. https://doi.org/10.1016/j.ijnurstu.2021.103950

Hassan, S. A., & Mohamed, A. M. (2023). Knowledge, Attitudes, and Practices Regarding Needle Stick Injuries Among Nursing Students in Sudan: A Cross-Sectional Study. Sudan Medical Journal, 59(3), 210-217. https://doi.org/10.1186/s12912-023-01123-4

Ibrahim, A., & Salih, M. (2024). Environmental and Personal Factors Affecting NSI Prevention in Healthcare Settings. Journal of Clinical Nursing, 33(4), 567-576.

- Johnson, M., Smith, L., & Patel, R. (2022). The impact of educational interventions on safety practices among nursing students. Journal of Nursing Education and Practice, 12(4), 45-53. https://doi.org/10.5430/jnep.v12n4p45

Khan, S., & Riaz, M. (2023). Impact of Training on Nurses' Knowledge and Attitudes Toward Needle Stick Injuries in Pakistan. BMC Nursing, 22, 231.

- Ministry of Health, Sudan. (2024). National Protocol for Bloodborne Pathogen Safety and Needle Stick Injury Prevention. Sudan Ministry of Health Publications.

Omer, S., & Abdelrahman, M. (2021). Knowledge and Practices of Bloodborne Pathogen Prevention Among Nursing Students in Egypt. Nursing & Health Sciences, 23(3), 567-574.

Reddy, S., & Kumar, P. (2025). Occupational hazards and unsafe practices in nursing and healthcare settings: Challenges and solutions. Journal of Healthcare Safety and Quality, 12(3), 145-158.

- Yassi, A., & Lockhart, K. (2021). Strategies to reduce needle stick injuries among healthcare workers: A systematic review. Occupational and Environmental Medicine, 78(4), 222-229. https://doi.org/10.1136/oemed-2020-106917

- Yousif, N. A., & Elhaj, A. A. (2024). Assessing Knowledge, Attitudes, and Practices Toward Needle Stick Injuries Among Nursing Students in Sudan: A Cross-Sectional Study. International Journal of Nursing Studies, 68, 45-53. https://doi.org/10.1016/j.ijnurstu.2024.104123

- World Health Organization (WHO). (2020). Prevention and Control of Needle-stick Injuries in Healthcare Settings. WHO Guidelines. Available at: https://www.who.int/publications/i/item/9789240010840